

THE FIFTH INTERNATIONAL CONGRESS OF ORNITHOLOGISTS.

THE fifth International Congress of Ornithologists took place in Berlin from May 30 to June 4. Like all the former congresses of its kind, it was well attended, although only a single American and comparatively few English ornithologists were present.

The opening address of the president, Prof. Anton Reichenow, of Berlin, was a lucid, though necessarily short, review of the progress of ornithology within the last 150 years and its present status.

The Hon. Walter Rothschild delivered a lecture on the former and present distribution of the so-called *Ratitæ*, embracing also some very interesting recent investigations by Mr. C. W. Andrews on the egg-shells of certain ostriches, especially some pieces of the egg of a fossil ostrich, found last year by Messrs. Rothschild and Hartert in the Algerian Sahara. Baron Loudon gave descriptions of the bird-life in Talysh and Transcaspiæ; Prof. Koenig narrated his journey up the Nile to Lado and Gondokoro; Dr. Otto Hermann explained the activity of the Royal Hungarian Central Bureau of Ornithology; Dr. Thienemann that of the "Vogelwarte Rossitten," especially the method and results of his experiments with "ringed birds"; while the other lectures held in the general meetings were about bird-protection and the preservation of "nature's monuments" as connected with bird-life. Numerous communications were made and lectures delivered in the various sections, their number being so great that in some of the sections the time available was hardly sufficient, and discussions had sometimes to be cut short. Of the lectures in the sections, mention can only be made of a few, as most of them were only of interest to specialists.

The proceedings of section i. (systematic, palæontology, anatomy, and geographical distribution) were opened with a lecture by Dr. Hartert, on "what we ought to do and what we ought not to do." The speaker pointed out many evils and shortcomings in the technical treatment of modern bird-study; he specially urged greater care to avoid new synonyms, demanded better descriptions, more cooperation, &c. He pointed out the necessity of liberality in lending specimens to competent persons and institutions, and regarded museums which did not lend material to others as behind the times. He also made clear the necessity of greater care in preparing and preserving the material for study, especially bird-skins, held that they should be more exactly and more securely labelled, and discussed various other technical details.

Mr. Friedrich Rosenberg spoke about the development of the Colymbidæ, Prof. Jacobi discussed the development and systematic position of the "Impennes," and Geheimrat Prof. Virchow gave the results of his study on the mobility of the nuchal vertebrae in the Spheniscidæ.

Prof. Neumann discussed zoogeographical problems, specially referring to the necessity of careful geographical study in connection with the description of subspecies of birds, and their distribution.

In section ii. (migration) a number of lectures were given, of which that of Rittmeister von Lucanus, about the height at which birds migrate, appeared to be of special interest.

In section iii. (biology, oology, acclimatisation), Mr. Lucanus also made very important statements regarding the psychology of birds. Dr. and Mrs. Heinroth lectured on the biology of certain Anatidæ, and on the breeding in captivity of *Caprimulgus* and *Locustella*.

Graf Zedlitz dealt with the breeding-seasons of African birds.

Dr. Weigold gave interesting details about the former and present status of bird-life on Heligoland, and recommended the continuation of regular observations on that island "before it would be too late."

In section iv. (bird-protection) the necessity for the prohibition of the introduction of feathers and bird-skins for millinery purposes was urged, and the question of international bird laws discussed.

Section v. was devoted to poultry and other domesticated birds, and appeared to be well attended.

At the meeting of the International Ornithological Committee it was decided that the *Ornis* should not be con-

tinued in the form of a regular periodical, but of irregular volumes containing the proceedings of the various ornithological congresses, and special scientific treatises, in the event of material and means being available for the purpose.

In every town a congress has its peculiar features. While some of the characteristics of the fourth Congress of Ornithologists in London were the excursions to Tring and Woburn Abbey, and the visit to the Bempton Cliffs, with their breeding-colonies of sea-fowl, the congress at Berlin was remarkable for the various liberal entertainments in the town. The city gave a dinner in the famous Town Hall, the Zoological Garden Society a luncheon, the Ornithological Society a supper, and one evening was pleasantly spent in the natural history theatre, called "Urania."

An illustrated guide and excellent map of Berlin were presented to every member, also a reprint of Lichtenstein's very rare "Verzeichniss einer Sammlung von Säugethieren und Vögeln aus dem Kaffernlande," of 1842, a description of the "Vogelwarte Rossitten," and various other pamphlets and booklets. E. H.

THE DANGERS OF FERRO-SILICON.¹

FERRO-SILICON, averaging about 13 per cent. silicon and made in the blast-furnace, has been used in steel works, and to a certain extent in iron foundries, for many years. Steel castings were made with about 0.3 per cent. silicon to help in the prevention of blow-holes, and at the same time to aid in giving the properties required by engineers; and in foundries the ferro-silicon is used to add to mixtures of iron, such as those containing large percentages of scrap, that would otherwise yield a hard casting, as the added silicon has the effect of changing the combined to free or graphitic carbon on cooling. Within the last few years much richer ferro-silicons have been made in electric furnaces, and have found a ready sale. They are useful for special crucible steels and for certain steels for electrical work, and also for adding silicon in the ladle in the case of basic open-hearth practice, as there it is impossible to do this efficiently on the hearth, though it is easily done in the acid process.

With the electrically produced high-grade ferro-silicon came trouble. The present writer remembers the great interest taken in the earliest recorded case of this trouble as given by Dr. Dupré and Captain Lloyd at the Iron and Steel Institute in May, 1904. Owing to a fire having occurred on a vessel, the cargo, including 50 per cent. grade ferro-silicon brought from Trieste, was discharged on December 17, 1903. On January 12, 1904, the forty-eight drums containing the ferro-silicon were removed to a warehouse in Bootle, and whilst being rolled from the truck on to the concrete floor one drum exploded. Dr. Dupré and Captain Lloyd, after careful investigation, pronounced the explosion to be due to PH₃ evolved owing to the action of damp air, and gave a weighty and serious warning with regard to the handling and storing of this comparatively new product.

So explosions and spontaneous ignition came in the train of the new material; but it was to make its powers felt in another way. On the S.S. *Vaderland*, Antwerp to New York, over a hold in which ferro-silicon was stored, fifty steerage passengers were made ill and eleven died, of whom nine were buried at sea, and two corpses landed at New York, as plague was feared. In March, 1906, two children died on a Rhine boat. On October 21, 1905, two children died on board a "keel" on the Keadby Canal; the father and mother were taken seriously ill, but recovered on deck. In February, 1907, on the *Olaf Wyjk*, Gothenburg to Antwerp, four passengers died. In May, 1908, on the S.S. *Uleaborg*, Stockholm to St. Petersburg, the crew and second-class passengers were taken ill, and two died. On October 29, 1908, on the keel *Harry*, Captain Bamfield and the mate, his grandson, started from Goole with ferro-silicon on board, apparently consigned as "scrap iron." On the night of Friday, October 30, the mate was

¹ "On the Nature, Uses, and Manufacture of Ferro-silicon, with Special Reference to possible danger arising from its Transport and Storage." Local Government Board Report, 1909. By Dr. S. M. Copeman, F.R.S., S. R. Bennett and Dr. H. Wilson Hake. Pp. viii+113. (Cd. 4958.) Price 1s. 11d.

taken seriously ill and removed. The captain took his wife and grandson on board and proceeded, but all three were taken ill. Bamfield died on November 6 and his grandson on the previous day. The cause of death was certified under that convenient term "ptomaine poisoning," but was afterwards proved to be due to fumes from the ferro-silicon of 50 per cent. grade (actual analysis, 53.9 per cent. silicon).

It required, however, yet another tragedy, with the added scare of cholera, to compel investigation, and this was provided by the case of the *S.S. Ashton* in December, 1908, on which, after a voyage of twenty-four hours only, from Antwerp to Grimsby, all the occupants of the emigrant quarters, fortunately only five in number, died between 6 p.m. on December 12 and 12.30 p.m. on the following day. This time cholera was feared, but examination by the Government bacteriologist at once negated this view. Mrs. Bamfield wrote on December 17, 1908:—"It has occurred to me since reading the account of this poisoning that there may be some of this (scrap) in the *S.S. Ashton*." Immediately these deaths were reported in the newspapers, Mr. Hodgson, Mrs. Bamfield's son-in-law, wrote to Dr. Simpson, medical officer of health for Grimsby, making a similar suggestion, and that this was the cause of the deaths (p. 20):—"It was apparently in consequence of this letter that attention came to be directed to the possibility of the deaths on the *S.S. Ashton* having been due to the presence of the ferro-silicon on board, suspicion having arisen, in the first instance, that the fatal illness of the passengers was due to cholera." This was abundantly proved, and resulted in the elaborate investigations of which this report is the record.

The report is a valuable one, showing that the authors have recognised the difficulties and grappled with them. The original should be in the hands of all interested in ferro-silicon from a medical, a shipping, or a metallurgical aspect. As the authors themselves state, further investigation is yet required, although rules that will almost ensure safety have been found.

Ferro-silicons of low grade, containing not more than 15 per cent. silicon and made in the blast-furnace, are beyond suspicion, and as safe to handle and to store as ordinary pig iron. The high-grades, 25 to 95 per cent. silicon, made in the electric furnace, and imported to the extent of about 4000 tons per annum, mostly from France, but to a less extent from Austria, Scandinavia, &c., include the dangerous varieties. The bulk has been made to 50 per cent. grade for little apparent reason other than ease in calculation of mixtures, a matter that may excite surprise until it is remembered that a manager, with his hundred worries per day, tries to avoid the hundred-and-first, in case it might prove "the last straw." The gases given off may at first have included acetylene, owing to the ferro-silicon being made in calcium carbide furnaces, but as that is never done now the poisonous gases given off are phosphoretted hydrogen and arseniuretted hydrogen, roughly 90 to 95 per cent. of the former to 10 to 5 per cent. of the latter. All are agreed that until more is known of the fundamental causes, those varieties around 50 per cent. silicon are most dangerous, and should neither be made nor bought. La Chambre Syndicate des Forces hydrauliques states that 30 to 40 per cent. and 47 to 65 per cent. grades should be avoided, but the remarkable omission of 40 to 47 per cent. grades is not supported by any experimental proof. The authors recommend the manufacture or use of only those varieties below 30 per cent. or above 70 per cent. silicon content for the present.

The section on the functions of ferro-silicon in steel manufacture hardly gets to the root of the real idea sometimes, but is near enough for general readers; and technical men are not likely to refer to this section of the report. It will be read for the results of the experiments and general investigations carried out and the opinions formed on the results, and these can be recommended. The report contains, besides matter already indicated, reports of conferences with Sheffield firms using ferro-silicon, investigations at places of manufacture, a description of the manufacture of ferro-silicon, conclusions and recommendations, Dr. W. Hake's chemical investigations, and Mr. Bennett's report on the composition and structure of ferro-silicon.

As the PH_3 is only formed in contact with moisture, the

material used to be packed in sealed drums, and sometimes was coated with paraffin wax; but this does not deal with the gas present in the cavities, and only transfers the danger, for drums exploded on opening and men removing the paraffin were made ill, so that these methods should be abandoned.

The report recognises an important point that is still obscure (p. 109):—"Dr. Heroult expressed himself as decidedly of opinion that the specially undesirable qualities exhibited by this particular grade (50 per cent.)—tendency to spontaneous disintegration and evolution of poisonous gases—were related to the amount of *aluminium* present in the alloy. He was unable . . . to advance any definite reasons for the opinion he had formed." Mr. Bennett later expressed the same opinion, and suggested that, as the heat of formation of Al_2O_3 is very great, the presence of a large percentage of aluminium is indicative of very high temperature reactions in the furnace, and that these reactions are favourable to the formation of compounds which readily break up into poisonous and explosive gases."

This can hardly be so, for Prof. Arnold, who, it is understood, will present a report later, has had one lot of ferro-silicon divided into two portions and melted in two crucibles. When molten, to one only was added 3 per cent. aluminium, and the two portions were cast into separate ingots. The present writer, being interested in the experiment, broke a piece off each ingot, and, dipping them in water, noticed that one had no particular odour, but the other smelt very strongly, the latter proving to be that to which aluminium had been added. A too enthusiastic repetition of the experiment as a test produced just a feeling of discomfort which the fresh air soon dispelled, this last being a point of much importance, as where lives were saved it was practically the governing remedy. "Two of the passengers also left their cabins and, although very weak, succeeded in getting on deck. These two survived" (p. 15). No. 5 of suggested regulations may be quoted:—"Storage places at docks or at works where ferro-silicon is used should have provision for free access of air, and should be situated at a distance from work-rooms, mess-rooms, offices, &c." (p. 115).

The main conclusions of the report have been mentioned, but all interested in the subject should obtain a copy, as the details of the investigations are well worthy of study.

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THE POSITION OF THE NEGRO AND PYGMY AMONGST HUMAN RACES.¹

A FULL analysis of the structural features of the negro shows that in many points he is more highly specialised than the less pigmented races of mankind, while in other characters he has remained more primitive. Although on the Continent there is a decided tendency amongst anthropologists to trace the descent of the human race through a non-anthropoid stock, yet those most familiar with the anatomy of the Primates still agree with Huxley's doctrine that the community of structure shared by man and anthropoids pointed to a direct community of origin. The deeply pigmented skin was a primitive feature; the gorilla was the negro amongst anthropoids; the three species of chimpanzee varied as the period of life at which pigmentation appeared. All available evidence points to a pigmentation of the early human stock, but speculations are handicapped by an ignorance of the functional value of pigment. It appears to protect the deeper tissues from certain injurious rays which are intermediate to heat and light. The skulls of Palæolithic Europeans show so many resemblances to those of Australian aborigines that a legitimate suspicion may be raised as to whether or not they did not also share some degree of the aboriginal pigmentation. The Palæolithic Gibraltar woman, whose skull is preserved in the Museum of the College of Surgeons, shows no community with the negro in the characters of her nose. The nose of that skull is altogether unlike that of any human race now known; it shares some features with the gorilla, while

¹ Abstracts of four Hunterian Lectures on "The Anatomy and Relationships of the Negro and Negroid Races," given at the Royal College of Surgeons, England, by Prof. Arthur Keith.